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Season's Greetings

To the military and civilian members of the Navy Medical Department, to their families and to our patients and friends, I send my best wish for a Merry Christmas and the sincere hope that the New Year will be both happy and rewarding. At the same time, I am deeply concerned for you whose happiness at this Holiday Season is compromised by loss or absence of loved ones. I sincerely hope that, whatever your Faith, you may obtain some comfort from the examples of sacrifice set by Christ whose birthday we honor.

I know that each of you — wherever you may be — is keeping bright the fire of the Christmas Spirit by your devotion to duty, by your resolve to protect freedom from the challenge of those who would destroy it, and by your sacrifices to bring about a true peace on earth for all men. I am proud to serve with you in this struggle for freedom and proud of the outstanding record that has been compiled by the Navy Medical Department. I know that you will, in the new year, continue your fine performances and make every effort to improve our programs and to provide the Service Family with patient care that is second to none. With faith, courage and dedication to our cause we can achieve these goals.



R. B. BROWN
Vice Admiral, MC, USN
Surgeon General

MANAGEMENT OF INJURIES TO THE INFERIOR VENA CAVA*

*James H. Duke, Jr., MD, Ronald C. Jones MD, and G. Tom Shires MD,
Dallas, Texas. From the Department of Surgery, the University of Texas,
Southwestern Medical School, Dallas, Texas. Amer J Surg 110(5): 759-763,
November 1965.*

Only within recent years has a significant evaluation of the management and prognosis of a large group of injuries to the inferior vena cava been reported in the surgical literature. In 1962 Starzl and associates reported on twelve patients with penetrating injuries of the inferior vena cava of whom eleven survived. DeBakey and associates recently expanded their original series which was published in 1961 to report a total of twenty-seven survivors of fifty-seven patients with injuries to the inferior vena cava. This remains the largest series reported concerning management of trauma to the inferior vena cava. Because the incidence of injury to the inferior vena cava is infrequent, it is the responsibility of the large cumulative series to report and evaluate the various facets of this clinical problem. This series is presented and analyzed to improve treatment and to correlate survival with the type, location, and extent of injury.

Clinical Material

During the past ten years forty-two patients with injuries to the inferior vena cava were operated upon at Parkland Memorial Hospital in Dallas, Texas. There were twenty-seven gunshot wounds, three shotgun wounds, five knife wounds, and seven blunt injuries involving the inferior vena cava.

Knife wounds of the inferior vena cava were the least frequent cause of death, while shotgun injuries had an associated 66.7 per cent mortality. The excessive mortality from shotgun injuries was a result of injuries associated with this type of trauma. Similarly, blunt trauma to the abdomen resulting in injury to the inferior vena cava was fatal in all but one case (Table I).

Associated Injury. Seventy-five per cent of the patients in this series has at least one other indication for exploration of the retroperitoneum besides the injury to the inferior vena cava. Eleven of Starzl's

twelve patients with injuries to the inferior vena cava had an additional indication to explore the retroperitoneal space. Associated retroperitoneal organ injuries in this series consisted of the pancreas (twelve), duodenum (ten), adrenal gland (two), kidney (five), ureter (eight), aorta (three), other retroperitoneal vessels including portal, iliac, mesenteric, and splenic vessels (eleven), liver (twenty-one), spleen (five), and colon (fourteen).

The mortality from injury to the inferior vena cava correlated well with the number of associated injuries to major vessels. There was a less striking relationship with the number of organs injured. Nineteen per cent of the patients in this series had an injury to the renal vessels. Of the seventeen patients who died, eleven (65 per cent) had from one to four injuries to other major vessels which included the renal, portal, superior mesenteric and iliac veins, or the aorta or one of its major branches.

Either multiple fractures of the extremities, the thorax, and skull or massive injury to the liver, spleen, or kidney was associated with the other fatal cases. It was this type of associated injury that was observed in the cases of inferior vena cava damage that was the result of blunt trauma. Four of the five patients who had combined injuries to the inferior vena cava and spleen died.

Table I
Types of Injury To The Inferior Vena Cava With
Associated Mortality

Types of Injury	Total	Lived	Died	Mortality (%)
Knife	5	4	1	20.0
Gunshot wound	27	19	8	29.6
Shotgun wound	3	1	2	66.6
Blunt	7	1	6	85.7
Total	42	25	17	40.4

* Presented at the Seventeenth Annual Meeting of the Southwestern Surgical Congress, Hot Springs, Ark., May 10-13, 1965.

Only three patients who had injury to any other major vessel in addition to the inferior vena cava survived. One of these was a remarkable survivor of a shotgun blast which injured the aorta, inferior vena cava, renal artery, and renal vein. The other surviving patients had either superior mesenteric vein or iliac vein wounds in addition to injuries to the inferior vena cava.

Location of Injury. Of the eighteen patients with injury to the inferior vena cava at or superior to the renal veins, only six (33.3 per cent) survived. A high mortality was anticipated in such cases because of the difficulty in obtaining adequate exposure and securing hemostasis. Injuries to the inferior vena cava at the level of the kidney were frequently associated with a concomitant injury to one of the renal veins. Eight patients in this series had associated injury to the renal artery or vein, but only one survived (Table II).

Injuries inferior to the renal veins but superior to the bifurcation of the inferior vena cava were more accessible and had the lowest mortality. Injuries at the bifurcation were accessible but more difficult to control since the injury frequently extended into the iliac veins. Control of both common iliac veins as well as the inferior vena cava was usually required before attempting repair.

Treatment

During preoperative preparation, the patient's vital signs are carefully monitored. A route for intravenous administration of balanced saline solutions and, if necessary, type-specific uncross-matched blood is established with a large bore needle or polyethylene catheter. In the event of a major venous injury inferior to the heart, the administration of intravenous fluids through a vein in a lower extremity may be virtually useless. Hence, it is strongly recommended that at least one intravenous route be established in an upper extremity in such cases. Simultaneously, a sample of blood for type and cross match and a urine specimen is submitted to the emergency laboratory for analysis. The urine is usually obtained at the time a Foley catheter is inserted into the bladder. The indwelling Foley catheter affords a reliable adjunct in monitoring the resuscitation and volume replacement of the patient.

Those patients who have blunt abdominal trauma are followed with serial abdominal paracentesis in an effort to obtain nonclotting blood which is considered an indication for immediate exploration. Abdominal signs after intraperitoneal hemorrhage occa-

Table II
Mortality According To The Level Of Injury

Location	Total	Lived	Died	Mortality (%)
Above renals	7	3	4	57.1
At renals	11	3	8	72.7
Below renals	17	15	2	11.7
Bifurcation	7	5	2	28.5

sionally did not appear for hours. It should be stressed that a negative paracentesis does not rule out intra-abdominal hemorrhage. Occasionally a patient with a retroperitoneal injury did not have a hemoperitoneum, but this was unusual because of the high incidence of associated organ injury.

Diagnosis was not difficult in most cases since all patients with injuries which potentially involved the peritoneal cavity were usually explored within one hour or less from the time of admission to the emergency room. When the abdomen was explored and brisk bleeding was encountered, finger pressure was the most advantageous technic for control of the hemorrhage. The utilization of one or two sponge sticks augmented the primary task of obtaining adequate exposure in a relatively dry operative field. Although packing might slow the bleeding it did not permit exposure. It was by no means a definitive treatment. The most difficult technical problems encountered were those in which there was an associated injury to a major vessel since prompt control of the hemorrhage was delayed.

Definitive technics to repair such injuries have been established at this institution. Proximal and distal control were usually mandatory even in the tangential wound. Partial occlusion clamps or tapes were placed near the site of the injury to avoid excessive hemorrhage from the lumbar veins.

An injury of the anterior wall or a tangential wound on the medial or lateral wall of the inferior vena cava was not as difficult to manage as the through and through injury. These injuries were usually controlled by placing the lacerated portion of the vein in a partial occlusion clamp which allowed patency of the remainder of the inferior vena cava. This also eliminated the annoying bleeding from the lumbar veins. The defect was repaired with No. 4-0 or 5-0 arterial silk.

The through and through injury to the inferior vena cava presented a more difficult technical problem, but repair was accomplished by one of two procedures. If the lacerations were in an antero-pos-

terior plane, the anterior defect was enlarged to visualize the posterior injury. The posterior wall was repaired through this opening with a continuous No. 4-0 arterial silk suture tying the suture on the outside of the vein. The anterior defect was then easily repaired. This method requires proximal and distal control of the vessel.

An alternate method of repairing the postero-inferior vena cava injury was that of rotating the vessel after vascular clamps had been applied to provide proximal and distal control and after the vessel had been dissected free from surrounding tissue. The posterior defect was then sutured from the external surface. This frequently required ligation and division of one or more lumbar veins. Particular attention was given the lumbar veins while dissecting the inferior vena cava since severe bleeding could occur by avulsing a vessel from this major vein. A suture repair was accomplished in all surviving patients except one patient who had ligation of the infrarenal inferior vena cava. Narrowing of the lumen was not over 50 per cent in any instance.

Every effort is made to re-establish adequate blood flow in the inferior vena cava when the injury is superior or adjacent to the renal veins. If a major segment of vein is destroyed a patch graft or an interposed vein graft may be required. The saphenous vein may be utilized by sewing two longitudinally opened segments of equal length together which will provide a large autogenous graft to be interposed within the defect. An alternate technic that can be employed to re-establish the continuity of the suprarenal inferior vena cava is the interposition of an excised segment of the infrarenal renal portion of the inferior vena cava. This technic requires ligation of the proximal and distal ends of the inferior vena cava as well as the adjacent lumbar veins. A segment as long as that portion of the vein immediately superior to the common iliac veins to the renal veins is potentially available.

These technics are considered preferable to ligation of the suprarenal inferior vena cava. Eleven cases in which the suprarenal inferior vena cava was ligated have been reported. In ten of these cases ligation was performed during the course of a urologic procedure for either neoplasia, hydronephrosis, or pyelonephritis. Only one patient is reported to have survived ligation of the suprarenal inferior vena cava for acute trauma.

In only those cases in which the injury is superior to the renal veins should the extra operative time be taken to perform such a procedure in a patient who is otherwise critically ill or has multiple organ inju-

ries. In the event of massive injury to the infrarenal inferior vena cava in which primary repair cannot be accomplished, ligation is justified. A synthetic prosthesis has proved to be of little value in replacing an entire circumferential caval segment because of the high incidence of thrombosis in a low pressure system and because the need for such a prosthesis has been rare since none of our patients with this degree of injury reached the operating room.

Comments

Mortality seemed to be primarily correlated with the incidence and frequency of associated injury to other major vessels. Of the seventeen patients who died, eleven (65 per cent) had associated injury to a major vessel. In support of this observation was the finding that massive uncontrolled hemorrhage at surgery was the cause of death in thirteen patients.

Only one of fifteen patients (7.7 per cent) survived when the inferior vena cava was found to be bleeding actively at the time of laparotomy. This finding correlated more closely with survival than any other single factor. There were varying amounts of blood in the free peritoneal cavity in each instance, but in every patient who survived, with one exception, venous tamponade or clot formation had occurred in a retroperitoneal hematoma. This condition allowed sufficient time for the institution of resuscitative procedures as well as proximal and distal control before the thrombus was removed. Of twenty-seven patients in whom there was no active bleeding when the abdomen was initially opened, three died (11.1 per cent). One of these patients had a very small retroperitoneal hematoma at exploration which was estimated to contain not more than 50 cc of blood. For this reason the retroperitoneal area was not explored. After the termination of the procedure, the patient suddenly became hypotensive. An unsuspected right hemopneumothorax was discovered and corrected with chest tubes. Despite blood and electrolyte replacement, the patient's condition deteriorated and he died. At autopsy the previously described 50 cc hematoma was massive and found to contain a fragmented right adrenal gland, a fractured right kidney, and a laceration of the inferior vena cava. This case occurred early in the series.

The case just cited indicated that small retroperitoneal hematomas should be explored for injuries to major vessels and other retroperitoneal organs. It is impossible to know the extent of an injury in the retroperitoneum until the area is explored. It is concluded that if a bullet or tract of penetration tra-

verses the retroperitoneal space near a vital structure, the area should be visualized even in the absence of a hematoma. The fact that a retroperitoneal hematoma is not expanding is of no prognostic value. In eleven of twelve cases reported by Starzl there was an additional indication to explore the retroperitoneal area.

In 44 per cent of the patients who survived twenty-four hours one or more complications developed and these included: edema of the lower extremities (one), pancreatitis (two), pancreatic fistula (two), pancreatic pseudocyst (one), subphrenic abscess (one), renal failure (three), wound infection (two) pneumonia (four), pulmonary embolus (one), fistulas of the small bowel (one), and pleural effusion (one). Only one of these patients had a complication related to the injury to the inferior vena cava. Bilateral lower extremity edema developed after ligation of the inferior vena cava at the site of injury without evidence of pre-existing venous disease. Almost all complications resulted from injuries to other organs. Only one patient required another major surgical procedure which was not related to the inferior vena cava injury.

Summary

1. Forty-two instances of injury to the inferior vena cava were found at laparotomy during the past ten years at Parkland Memorial Hospital. Of this group twenty-five survived, yielding a mortality of 40.5 per cent.

2. Three principal factors determining survival were associated major vessel injury, the level of inferior vena cava injury, and whether or not the vessel was actively bleeding at laparotomy. The latter seems to be the most important factor.

3. All retroperitoneal hematomas should be explored. In 75 per cent of these cases, there was an additional reason to explore the retroperitoneal area.

4. Suture repair by the technics outlined was the preferred method of treatment. Ligation was occasionally necessary if the injury was below the renal veins and primary repair could not be accomplished.

5. It is essential to have a set of major vascular instruments immediately available when treating intra-abdominal trauma.

(The references to this article may be seen in the original article.)

Nonspecific Ulcers of the Small Intestine*

*Donal M. Billig MD and George L. Jordan, Jr., MD, Houston, Texas.***
Amer J Surg 110(5): 745-747, November 1965.

Nonspecific ulcer of the small intestine is a lesion which has not been encountered frequently in the past. Since 1962, however, we as well as others have noted a marked increase in its incidence. The role of enteric-coated potassium chloride as a possible etiologic factor has received much attention. The following is a report of twenty surgically treated patients in whom the diagnosis of nonspecific ulcer was made.

Clinical Features

There were twelve men and eight women ranging in age from thirty to sixty-nine years, with an even distribution through the fourth, fifth, and sixth decades.

No prodromal symptoms indicated the presence of small-intestinal ulceration. In every instance the presenting symptoms were those of a complication

of the ulcer, intestinal obstruction, perforation, or hemorrhage.

Sixteen patients presented with signs and symptoms of small-intestinal obstruction. Nausea, vomiting, tinkling borborygmi, and peristaltic rushes were present. Fifteen patients had had recent prior episodes of colic, distention, and subsequent decompression with passage of flatus; several had been under the care of a physician for at least one prior episode. The duration of recurrent obstructive symptoms prior to surgical intervention varied from a single recurrence eight days after the original episode to multiple recurrences over a five month period. Intermittent diarrhea was present in five patients, most often coinciding with relief of distention during the decompressive phase.

The three patients with perforation presented signs and symptoms of acute peritoneal inflammation. Two had rigid and silent abdomens with radiologic demonstration of free subdiaphragmatic gas.

* Presented at the Seventeenth Annual Meeting of the Southwestern Surgical Congress, Hot Springs, Ark., May 10-13, 1965.

**From the Cora and Webb Mading Dept. of Surgery, Baylor University College of Medicine, the Ben Taub General Hospital, The Methodist Hospital, and Veterans Administration Hospital, Houston, Texas.

The third patient in this group had progressive pain in the right lower quadrant over a thirty-six hour period. In the right lower quadrant there was tenderness and rebound tenderness with muscle guarding. The preoperative diagnosis was acute appendicitis.

One patient presented with weakness, fatigue, and pallor, and was found to have profound anemia due to chronic gastrointestinal blood loss.

Roentgenographic Features

Films of the abdomen were made in nineteen of the twenty patients. Of the sixteen patients with obstruction, fifteen demonstrated dilated loops of small bowel and air fluid levels. The intestinal gas pattern was normal in the sixteenth patient.

Two of the three patients with perforation had free subdiaphragmatic gas. The third patient in this group had normal roentgenograms.

Small-intestinal series were performed on ten patients via the oral route, and in four patients opaque material was inserted through a long intestinal tube. One patient had small-intestinal visualization by both routes. Thus, thirteen patients had a total of fourteen small-intestinal studies. Two examinations were interpreted as within normal limits. Five studies demonstrated dilated loops only. A definite constricting lesion was noted in seven. In each instance the lesion was described as annular or constricting. In no case was a radiologic diagnosis of ulceration made.

Pathology

The most proximal lesion was in the mid-portion of the small bowel. The remaining lesions were in the ileum. Fifteen patients had single lesions, four had two ulcers, and one had three ulcerations. The distance between multiple lesions varied from 3 cm to several feet. In all patients with obstruction there was definite narrowing of the lumen by a circumferential stricture, with dilatation of the bowel proximal to the lesion. The intestinal wall was thickened and indurated in the area of the lesion. In one case the surgeon noted that handling the bowel produced petechial hemorrhages on the serosal surface similar to those seen over an active duodenal ulcer.

In nineteen patients microscopic evidence of acute and chronic inflammation was observed. One patient with a perforated ulcer had acute inflammatory changes only. Chronicity was evidenced by submucosal fibrosis, granulation tissue, and chronic inflammatory cells. Varying degrees of submucosal fibrosis were present in ten patients while nine had granula-

tion tissue alone without fibrosis. One patient had complete mucosal healing at surgery. The mucosa over the stricture had no villi, indicating recent re-epithelialization. All other patients had mucosal ulceration at the time of resection, but in several there were early attempts at mucosal healing.

Nine of ten patients with fibrosis had obstruction. The duration of symptoms in patients with fibrosis averaged sixty days while those with granulation tissue alone had an average duration of symptoms of forty-five days. There was considerable overlap between the two groups.

Mesenteric nodes were enlarged in eight patients. Microscopic examination revealed non-specific lymphnoditis in all cases. The mesentery was thickened and inflamed in patients with perforation and was normal in the others.

Treatment and Results

The preoperative management of these patients consisted of correction of fluid and electrolyte imbalances, plasma or blood replacement as indicated, and intestinal decompression by nasogastric suction or long intestinal tube as the situation demanded. The three patients with perforation were prepared rapidly for immediate emergency surgery, whereas the remaining patients were operated upon electively.

Resection of the involved area with entero-anastomosis was performed in all twenty patients. One patient, in addition, had suture closure of a perforated area. Each of two patients had two resections of lesions which were too far apart to resect in continuity. No bypass procedures were performed.

Postoperatively saphenous thrombophlebitis developed in one patient which responded to heat and to bedrest with elevation. There were five wound abscesses. Two of these occurred in patients with perforation and three in patients with obstruction. All responded well to local care of the wound. There were no intra-abdominal complications, and the only death occurred on the thirtieth postoperative day as a result of pulmonary embolus and congestive heart failure. One incisional hernia which developed during the late postoperative period was successfully repaired one year after operation. There have been no proved recurrences to date. Eighteen patients have remained free of symptoms. One patient has required hospitalization on several occasions because of vague abdominal pain. Repeated studies have revealed no abnormality of intestinal function, and she has remained without obstruction.

Comments

Multiple etiologic factors are responsible for ulceration of the small intestine. Marginal ulcers, ulcers secondary to regional enteritis, typhoid fever, or other Salmonella infections, uremic ulcers, ulcers after radiation of the small bowel, and mucosal slough after vascular compromise to a segment of small intestine are well known entities.

Ulcers of the small bowel in which none of the aforementioned etiologic agents can be implicated have been classified as nonspecific ulcers. There has been a recent increase in the number of such lesions reported by other authors. Interest and concern over the possibility of enteric-coated potassium chloride tablets and chlorthiazide as etiologic agents have been noted. One group reports seventeen cases of annular obstructing ulcers in which each patient had been taking enteric-coated potassium chloride. In our twenty patients, only three had a history of ingestion of enteric-coated potassium either alone or in conjunction with a diuretic. Whether or not the enteric-coated potassium compounds are related to these lesions, which we have begun to recognize as increased in incidence over the past two years, are somewhat different from the nonspecific ulcers reported in the literature prior to 1963, as reviewed by Guest. The current reports indicate that by far the vast majority of these lesions are obstructive in nature. This was the least common complicating feature in the older reviews, comprising only 9 per cent. Fifteen per cent of the lesions were estimated to be annular in the older literature. More recent authors have reported almost all the lesions to be annular. Thus, not only has the incidence changed, but also the clinical spectrum and pathologic features have changed, comprising very strong evidence that we are dealing with some new etiologic agent producing annular ulcers of the small intestine.

While the laboratory has been of little help in the diagnosis, radiologic examination of these patients has yielded a great deal of information. In patients with obstruction roentgenographic evidence has pointed to the small intestine as the primary cause of the disease in almost every instance, either by plain films of the abdomen, small-intestinal series, or both. Small-intestinal series performed by others have revealed annular constricting lesions. Morlock, Goehrs, and Dockerty were able to demonstrate such a lesion in four of nine patients, an incidence very similar to our own. While an ulcer niche has been demonstrated, this is a rarity, and the shallow nature of these lesions makes it unlikely that this

can be a consistent radiologic finding. Nonetheless, it is possible to suspect strongly a small-intestinal ulcer when an isolated annular lesion is present with an otherwise normal mucosal pattern. Alterations due to dilated bowel must be taken into account.

The difficulty in diagnosis which we have shared with others is attendant upon the fact that prodromal symptoms are vague or non-existent. In each of our patients the presenting symptoms and physical findings were referable to a complication of the ulcer. In no instance was it possible to establish the diagnosis preoperatively (Table I). In the light of our current experience we are now able to suspect the diagnosis in a patient with recurrent episodes of a small bowel obstruction who has had no prior abdominal surgery. The radiologic criteria outlined herein, when present, lend strong support to the diagnosis.

These lesions are not always easy to identify at operation. When a prior operation has caused adhesions, the lesion may be easily missed unless the bowel at the transitional point of dilatation is carefully palpated for induration and ability to dilate. A second stenosing lesion distal to the first may be easily missed unless one keeps in mind the occasional multiple nature of these lesions. Perforations are often extremely small, and when the bowel is edematous as a result of diffuse peritonitis, the perforation may be difficult to locate.

In our opinion the treatment of choice is resection and enteroanastomosis. Pathologic examination almost invariably has shown chronicity with fibrosis, granulation tissue, or both. Such an area of bowel is not likely to return to normal. Bypass of an obstructed lesion creates a blind loop with all of its attendant potential problems, and still requires an enteroanastomosis for treatment. While it is true that

Table I
Preoperative Diagnosis in Twenty Patients With
Ulceration of the Small Intestine

Diagnosis	No. of patients
Intestinal obstruction	16
Adhesive bands	6
Stenosis of bowel secondary to vascular occlusion	1
Cause undetermined	9
Perforated ulcer	2
Appendicitis	1
Gastrointestinal hemorrhage	1
Total	20

suture closure, and bypass plus suture closure have been used successfully, we are still of the opinion that resection is the treatment which will offer the best chance of a permanent cure.

Summary and Conclusions

A sudden increase in the number of small-intestinal ulcers has become apparent in this and other centers. The evidence suggests a new etiologic background for these lesions. The role of enteric-coated potassium chloride is discussed.

Partial and intermittent small-intestinal obstruction is the most common mode of presentation. The demonstration of an annular lesion with dilated small bowel proximal to it is the characteristic radiologic finding in these lesions. Resection of the involved segment of small intestine with enterostomy in our opinion, offers the safest means of cure.

In our experience there has been no recurrence of these lesions after surgical treatment. (The references to this article may be seen in the original article.)

THE USES AND ABUSES OF PSYCHOTROPIC DRUGS

LT Richard L. Gold MC USNR

For over one decade, potent psychotropic drugs have been in vogue. Their uses are well known to those who prescribe them daily. Their side effects are many, and unfortunately not as public. This paper will attempt to briefly survey the psychotropic drugs in use today with particular emphasis upon (1) their uses in clinical medicine apart from psychiatry, and (2) their multiple side effects.

Classification

The following classification is offered for the clinician to facilitate his evaluation of the type of psychotropic drug he wishes to use:

1. Sedatives and Hypnotics
2. Anti-Depressants
3. Tranquilizers
4. Combined Psychotropic Drugs

Discussion

1. Sedatives and Hypnotics. Included in the group of sedatives and hypnotics are barbiturates and non-barbiturates. Clinicians have used barbiturates for pre-operative sedation and nighttime sedation successfully for many years. For most patients, one injection or pill will not cause any bad effects, however, the incidence of idiosyncratic reactions in elderly people, and even in those presumably healthy, have caused a wholesome caution against the indiscriminate use of barbiturates for sedation in the age group over 40. It has been reported, and personally observed, that only one dose of barbiturates is enough to cause a transient psychotic reac-

tion in susceptible patients. The addiction hazard of barbiturates is great, especially in the alcoholic or previously addicted patient.

The entire class of non-barbiturate sedatives and hypnotics offer the clinician a wide choice of safe drugs. Perhaps one of the oldest but best drugs is chloral hydrate (Noctec® being an example). If used in large dosages (one gram h.s. repeated once) this drug is an excellent choice for nighttime sedation. It is well tolerated by the elderly person and has few side effects. In alcoholic patients, paraldehyde is perhaps one of the finest sedatives. The clinician may not like the smell of the drug, but it works. Caution is to be used in the intramuscular injection of paraldehyde as improper superficial injection may cause tissue slough. In the elderly patient, the cautious and judicious use of spiritus frumenti is sometimes of value as a sedative.

The non-barbiturate group also includes such drugs as glutethimide (Doridan®), methypyrilon (Noludar), and ethchlorvynol (Placidyl®). All are well tolerated; however, an addiction hazard does exist with Doriden. Placidyl® has been reported to give some patients a profound "hangover."

Over-the-counter sedatives and hypnotics such as Sominex, etc., should never be used or even suggested for use by the clinician. Their easy availability makes it impossible to be sure of the dosage taken.

All sedatives and hypnotics should be prescribed with caution, as they are used all too frequently for suicidal attempts and gestures.

Never prescribe these drugs in a quantity that can kill if taken all at once. Limit the prescription to 10-15 pills and never allow them to be refilled. If an

addiction is suspected, hospitalization is indicated for withdrawal.

2. Anti-Depressants. The use of anti-depressant drugs is widespread among clinicians, without the complete knowledge of the hazards involved. The non-amine oxidase inhibitors or direct stimulants such as methamphetamine (Methedrine®), Desoxyn®), amphetamine sulfate (Benzedrine), d-amphetamine sulfate (Dexedrine®) are used for their anorexic effects. The physician is cautioned, however, that these drugs can cause increased nervousness, agitation, insomnia, and are known to cause "rebound depression" when suddenly stopped. These drugs should not be used in hypertensive patients, patients with coronary artery disease, and in severe neurotic or psychotic patients. In order to avoid insomnia they should never be given after 4 p.m.

As an interesting sidelight, it is to be noted that amphetamines have a paradoxical effect in children and will cause hyperactive children to slow down, whereas the use of barbiturates in children may cause them to become more hyperactive. Other non-amine oxidase inhibitors include imipramine HCL (Tofranil®) and amitriptyline HCL (Elavil®). Monoamine Oxidase inhibitors, used as anti-depressants, include nialamide (Niamid), isocarboxazid (Marplan), phenelzine dihydrogen sulfate (Nardil) and tranylcypromine sulfate (Parnate). The use of these drugs should be limited entirely to the psychiatrist. If a patient is depressed enough to warrant the use of these drugs, he is also depressed sufficiently that he should be seen by a psychiatrist. Because of the toxicities of these drugs, careful physical evaluation, blood tests, and liver profiles are necessary. Patients who are placed on these drugs are also those who are potential suicidal risks at one time or another during their depression.

3. Tranquilizers. The major tranquilizers came into clinical use just over 10 years ago. The first derivative of phenothiazine, the parent compound, was promethazine HCL (Phenergan®), a potent long-acting antihistaminic. Chlorpromazine HCL (Thorazine®) was developed through its chemical relationship to Promethazine. Thorazine® is the prototype and still one of the most effective tranquilizers in use today. Its use in agitated psychotic states is well known. It can control and stop psychotic symptoms. It is used widely in pre- and post-operative sedation at low dosage levels, and in drug and alcohol withdrawal states. It is used in the treatment of neurodermatitis. Chlorpromazine is used in

the treatment of the intractable pain of patients with inoperable cancer. The patient is aware of the pain but it is viewed as a more objective phenomenon. Chlorpromazine also potentiates the analgesic and sedative actions of the morphine group of narcotics. It is also of valuable clinical use as an adjuvant in general anesthesia. Its hypothermic effect through peripheral vasodilation is an advantage; however, its hypotensive effects in surgical patients is a distinct disadvantage.

It should be cautioned, that large dosages of chlorpromazine can cause central nervous system depression, epileptic attacks, hypotensions, leukopenia, and bone marrow depression. It has recently been noted that long term use of Thorazine® may cause retinal and epidermal pigmentation. Jaundice may be caused by even small doses of Thorazine® and is not dose-related. It is believed that the intra-hepatic bile canal obstruction is due to a sensitivity reaction.

The phenothiazines as a class of drugs potentiate alcohol, narcotics, and barbiturates, and extreme caution should be used with these combinations. The extra-pyramidal side effects of the phenothiazines are well known. These include Parkinsonism, dyskinesia, and akinesia. Phenothiazines also produce galactorrhea, decreased libido, and menstrual irregularities.

Promazine HCL (Sparine®) is well tolerated by the alcoholic patient; however, if it is given in large doses it may be epileptogenic. Promethazine HCL (Phenergan®) is widely used in pre- and post-partum sedation, as well as for its antihistaminic properties. Prochlorperazine (Compazine®) causes a high incidence of Parkinsonism but it is still a good tranquilizer and anti-emetic. A number of cases of oculogyric crises have been personally observed following the intramuscular injection of prochlorperazine.

Other phenothiazine derivatives include perphenazine (Trilafon®), trifluoperazine (Stelazine®), thioridazine HCL (Mellaril®), fluphenazine (Prolixin®), and mepazine (Pacatal®).

Reserpine's use in cardiac hypertension is well known. It is used as a tranquilizer at a dosage level of 3 to 5 mg daily in disturbed psychotic patients. Side effects of hypotension, bradycardia, and purpura have been observed. Severe depressive episodes, including suicide, have been reported with patients taking reserpine.

The minor tranquilizers may be used with caution on an outpatient basis. This class of drugs, widely in

use by the non-psychiatrist, include chlorprothixene (Taractan®), (a phenothiazine analog), hydroxyzine HCL (Atarax®), meprobamate (Equinil, Miltown), chlordiazepoxide HCL (Librium®), and diazepam (Valium®) (a Librium analog).

Chlorprothixene is useful in mildly agitated patients who can be treated on an outpatient basis. Its value is limited. Hydroxyzine is another mild tranquilizer used in pre- and post-operative sedation.

Meprobamate is an excellent muscle relaxant. Its abuse can result in severe withdrawal symptoms, including seizures and ataxia. If the usual dosage of 400 mg q. i. d. is not sufficient to control symptoms, another drug should be tried, instead of increasing the dosage of meprobamate.

Librium is very specific for the patient suffering from anxiety. It may, under certain circumstances, unmask a severe depression after anxiety is relieved. It is an excellent drug for use in alcoholic patients. It should be used in sufficient strength, i.e. 25 mg t. i. d. orally, and in delirium tremens 100-200 mg intramuscularly or intravenously.

Diazepam (Valium) was recently released for use as a tranquilizer. It is also specific for anxiety and can also be used in the anxiety-depression diad of symptoms. Whereas, Librium may cause a patient to appear more depressed by taking away the anxiety, Valium appears to have some anti-depressant effect. Valium is also an excellent muscle relaxant and can control the athetoid movements of cerebral palsy patients. Valium is well tolerated at its recommended dosage (5 mg t. i. d.) and has surprisingly few side effects. At higher dosages drowsiness and ataxia have been reported.

4. Combined Psychotropic Drugs. Combined psychotropic drugs are to be avoided if possible. They are often used to stimulate, elevate mood, and sedate at the same time. They are also used for their anorexic effects. Included in this class of drugs are:

Deprol (400 mg meprobamate and 1 mg benactyzine)

Desbutal (5 mg methamphetamine and 30 mg phenobarbital)

Dexamyl (Dexedrine and amobarbital at various dosages)

Prozine (200 mg meprobamate and 25 mg promazine)

Conclusion

The physician is cautioned that the use of psychotropic drugs is "tricky business," and has many dangers. Most physicians select one drug in each group and as long as no side effects appear, continue to use that drug. A wide variety of drugs are available to meet almost any need. Constant precautionary measures must be observed when these drugs are used. The physician must be aware of the side effects of the drugs he uses and must stop using the drug (or in rare cases, lower the dosage) when these side effects appear. New side effects may also appear, after the prolonged use of any drug.

The rapidly changing field of psychopharmacology requires periodic re-evaluation, revision, and re-awakening. The physician who has not looked at the new psychotropic drugs for many years might be surprised, bewildered or confused. We hope that this brief survey will encourage further introspection, awareness, and questions concerning the uses and abuses of psychotropic drugs.

CEPHALOTHIN IN CYSTOSCOPY AND RETROGRADE PYELOGRAPHY

Harry Seneca, John K. Lattimer, Margaret Reilly and Patricia Peer. From the Department of Urology, Columbia University and the Presbyterian Hospital, New York, New York, J of Urol 94(4):489-491, October 1965.

Cephalosporium acremonium was isolated from sewage in Sardinia in 1945,¹ and in 1955, a penicillin (cephalosporin N), antibacterial steroids similar to halvolic and fusidic acid (cephalosporin P) and cephalosporin C were identified.²⁻⁵

Cephalosporin C is the naturally occurring variety of the compound with a structure similar to penicillin. It is 7 amino-cephalosporanic acid, and consists

of a B-lactam ring attached to a sulfur-containing benzene ring (di-hydrothiazine). The semi-synthetic derivative, cephalothin, is 7- (thiopene-2-actamino)- cephalosporanic acid and is obtained from cephalosporin C and thiopene-2-acetic acid. It is a cream-colored crystalline solid which is very stable in the dry state and is moderately soluble in distilled water, giving rise to a solution that has a pH of 5.2.

The antibacterial properties are not altered materially with changes in pH from 5 to 8. In solution, the drug is fairly stable and maintains its potency in the ice box for 48 hours.

Although the nucleus of cephalothin resembles very closely that of penicillin, it is not inactivated by penicillinase. However, cephalosporinase inactivates it, with the opening of the B-lactam ring. Penicillinase, a B-lactamase of 6 amino penicillanic acid, has some effect on the nucleus of 7 amino cephalosporanic acid. Antigenically, penicillinase and cephalosporinase are distinct. There is no cross resistance between penicillin and cephalosporin. It is a broad spectrum antibiotic which is active in low concentrations against *Pneumococcus*, *Streptococcus*, *Staphylococcus*, *Shigella*, *Salmonella*, and *Proteus*. *Escherichia* and *Aerobacter* are less susceptible and *Pseudomonas* and *Klebsiella* highly resistant. Penicillin sensitive and resistant strains of *Staphylococcus* were found to be equally sensitive to cephalothin. In vitro drug resistance was observed with gram-negative rods, but *Staphylococcus* was less likely to become resistant. It stimulated the production of penicillinase by *Staphylococcus* which remained susceptible to cephalosporanic acid derivatives. It is more toxic to cultures of human amnion and mouse embryo cells than penicillin G but less toxic than oxytetracycline, chlortetracycline and declomycin; however, tetracycline had the same toxicity.⁶⁻⁸

The toxicity of the drug is low. The LD-50 intraperitoneal dose in the rat is 6.25 gm per kg, in the mouse 7 gm per kg and intravenously 4 and 5 gm per kg respectively. Microbiologically active o-desacetyl metabolites with unchanged cephalothin are excreted in the urine. This hydrolysis is brought about by an esterase which is found in the kidney, liver, small intestine and stomach. Three quarters are excreted in the urine, and tubular secretion can be completely blocked by probenecid.⁹

When 500 mg cephalothin is injected in man intramuscularly, the blood level of 10 µg per ml is attained in 30 minutes and with 1 gm it reached 20 µg per ml, and measurable amounts were still present after 4 hours. From 60 to 90 per cent of the administered dose is recovered in the urine in 6 hours, the concentration ranging from 368 to 1,310 (average 819) µg per ml following 0.5 gm intramuscularly. When the drug was given in 0.5 to 1 gm single dose by mouth, only 5 per cent appeared in the urine and the blood concentrations were too low for titration. Clinically the drug was active in *B. hemolytic streptococcus*, *pneumococcus*, *E. coli*, *Proteus*, and *Klebsiella* infections, but *Pseudomonas*

and certain strains of *Proteus*, *Aerobacter* and enterococcus were resistant. Among 61 cases, good results were obtained in 90 per cent of coccal infections and 85 per cent of gram negative rod infections, with bacteriological cure in 86 per cent of the former and 68 per cent of the latter group. The daily dose varied from one to 12 gm intramuscularly. Seven patients in whom penicillin was contraindicated tolerated cephalothin very well.¹⁰ Cephalothin therapy was successfully used in 77 of 80 infections caused by *Staphylococcus*, *Streptococcus*, *pneumococcus*, *Escherichia*, *Cl. perfringens*, *Aerobacter*, *Proteus*, *Streptococcus faecalis*, but failed to arrest miliary tuberculosis, *Hemophilus*, meningitis, and vaccinia. No cross sensitivity between penicillin and cephalothin could be documented. Untoward reactions were infrequently encountered and consisted primarily of mild allergic reactions. Superinfection was not observed in this series and it produced no reactions in patients allergic to penicillin. Two to 12 gm of the drug were injected either intramuscularly or in the form of infusion, in 24 hours.¹¹

We used cephalothin intramuscularly in 24 patients. The pathogens were primarily gram-negative rods of *Proteus*, *Aerobacter-Klebsiella-Escherichia* group, *Staphylococcus* and *Gaffky*. It was administered intramuscularly, 1 gm, 4 times daily for 10 days. In staphylococcal and *Gaffky* septicemias, the drug was given intravenously up to 10 to 12 gm a day. Our clinical observations with this drug are in harmony with the findings of the other investigators. In a separate report, we shall analyze the systemic use of this drug in various infections.

Material and Methods

For this study, attempts were made to evaluate the bactericidal activity of cephalothin when used as a bladder irrigation during *cystoscopy*. The drug was dissolved so that a fresh solution in sterile saline contained 1 mg per ml antibiotic. Just as the cystoscope was introduced, a urine culture was obtained as a control in each case. After insertion of the cystoscope, 20 ml saline was introduced and kept in the bladder for 2 minutes. Some of this fluid and urine mixture was then recovered through the cystoscope. Specimens from each case before and after cystoscopy were cultured on routine laboratory media and the bacteria were identified.

The same procedure was used in the cephalothin studies, except that in lieu of 20 ml saline, 20 ml saline containing 20 mg cephalothin was introduced into the bladder and then cultured. Although about 350 irrigations were performed using cephalothin,

only 106 cases of cephalothin with 106 saline controls were studied bacteriologically. Table 1 shows the results of 106 cases of cystoscopy performed using cephalothin as an irrigation versus 106 cases of controls using saline. It is apparent that in the cephalothin group, there were 25 cases which had positive cultures before and after cystoscopy while in the saline control group there were 35 cases. In the cephalothin group, there were 58 cases which had negative cultures before and after cystoscopy while in the saline control group there were 46 cases. In the cephalothin group there were 21 cases (19.8 per cent)

Table 1

Comparison of irrigating bladder with 20 ml saline containing 1 mg per ml cephalothin and 20 ml saline control during cystoscopy

Pathogens in urine	Cephalo- thin Group	Saline Control Group
No. of patients -----	106	105
Pre- and post-cystoscopy		
positive -----	25	35
Staphylococcus -----	8	9
Aerobacter -----	7	8
Escherichia coli --	4	5
E. freundii -----	2	—
E. intermedia -----	1	1
Paracolon -----	1	—
Pseudomonas -----	1	3
Proteus -----	1	6
Enterococcus -----	—	1
Streptococcus -----	—	1
B. subtilis -----	—	1
Pre-positive, post negative	21	15
Staphylococcus -----	12	9
Aerobacter -----	2	1
E. coli -----	1	2
E. freundii -----	—	1
E. intermedia -----	2	—
Proteus -----	2	—
Enterococcus -----	1	1
Streptococcus -----	1	—
Gram-negative rod ----	—	1
Pre-negative, post-positive --	2	9
Staphylococcus -----	1	4
Aerobacter -----	—	1
Pseudomonas -----	1	2
Enterococcus -----	—	1
B. subtilis -----	—	1
Pre- and post-negative ----	58	46

which were positive before cystoscopy and negative (no growth) following cystoscopy. Twelve previously had had Staphylococcus, 2 Aerobacter, 1 E. coli, 2 E. intermedia, 2 Proteus, 1 enterococcus and 1 Streptococcus. By contrast, in the saline control group, only 15 (14.1 per cent) were positive before cystoscopy but became negative after cystoscopy. Among the saline controls whose urine cultures became negative after cystoscopy, there were 9 cases of Staphylococcus, 1 Aerobacter, 2 E. coli, 1 E. freundii, 1 enterococcus and one unidentified gram-negative rod. There were no allergic or irritative reactions in any of the 212 cases, either with or without cephalosporin.

Noteworthy in this investigation was the group in which the urine culture was negative before cystoscopy, but following introduction of the cystoscope, the culture became positive. In the cephalothin group, 2 patients who previously had sterile urine were contaminated with Staphylococcus and Pseudomonas. In the saline control group, 9 patients had sterile urine prior to cystoscopy, but following instrumentation, the urine was contaminated. Four patients acquired Staphylococcus, 2 patients acquired Pseudomonas, one patient each acquired Aerobacter, enterococcus and B. subtilis. No toxic side effects were observed in these cases.

We are now trying the effect of solutions of 5 mg per ml cephalothin and 100 to 500 ml saline cephalothin solution in routine cystoscopies.

Cephalothin in retrograde pyelogram. Two milliliters of saline containing 2 mg cephalothin were added to the radiopaque solution of methyl-glucamine diatrizoate (renografin, Squibb), which was then gently introduced into the pelvis of the kidney through the ureteral catheter in the cystoscope. The rest of the procedure was the routine radiological examination taking films of the patient in various positions. The medicated contrast medium was not drained by the catheter but was left in the kidney pelvis to drain by itself. As of the writing of this manuscript, 23 such retrograde pyelograms have been performed, with no undesirable side effects or toxicity and the pyelograms have shown no variation. No bacteriological examinations were carried on in these cases. Presently we are planning to use 5 mg per ml cephalothin solution in an effort to improve the bactericidal efficacy of the procedure.

Summary

Cephalothin proved to be an excellent antibacterial agent for incorporation into bladder and kidney irrigating solutions. As used through the cystoscope

in this study, 106 cystoscopic examinations done with cephalothin instilled into the bladder were compared to 106 cystoscopies using just saline. Not only were larger numbers of cases negative at the end of the procedures using cephalothin, but there were only 2 cases made positive during cystoscopy whereas in the control group 9 cases became positive after instrumentation.

Its spectrum was sufficiently broad to cover most contaminants, there was no toxicity locally, and it

had the advantage over neomycin and bacitracin solutions in that it was not nephrotoxic. Nephrotoxicity could be important in patients with possible reflux, and certainly if an agent was to be used in retrograde pyelographic solutions and in kidneys with obstruction or advanced renal damage, as is so often the case. The amount of reduction in contamination of the bladder by the cystoscope, brought about by the use of cephalothin in examination, was statistically significant.

FROM THE NOTE BOOK

NBS DEVELOPS BLOOD FLOW SENSOR

One of the things that medical scientists would like to be able to do is to measure blood flow in the human body without having to use operative techniques. Long-term research on ways of measuring blood pressure and flow, conducted by the National Bureau of Standards (U.S. Department of Commerce) for the Veterans Administration, has revealed new information about the electrical properties of blood. As a result, the relationship between blood flow and conductivity is now better understood, and previously unchallenged assumptions about electrode placement and configuration have been corrected. The NBS team, composed of Merlin Davis, W. D. Hampton, and C. E. Lowe, Jr., also developed and tested a prototype blood flow sensing system in its work for Dr. Edward D. Freis of the VA.

New ways of measuring blood pressure and flow which the Bureau has devised and instrumented for the VA should be of interest in cardiological, pharmacological, and psychological research. Under this program NBS has already produced an arterial pulse waveform transducer which responds when pressed against the patient's skin overlying an artery.

Experimental blood flow instrumentation has been tested with simulated circulatory systems at the Bureau's instrumentation laboratories and on animal subjects. It offers two advantages over other conductivity-type flow indicators: it can be used with only one electrode inserted in the bloodstream and it depends on a stable mathematical relationship. The in-stream electrode is small enough for use in a catheter, a flexible tube with which the electrode can be inserted into a blood vessel and positioned throughout much of the bloodstream. The other electrode makes contact with the subject's skin.

Conductivity of Flowing Blood

Previous experimentation, both at the Bureau and elsewhere, has been directed at measuring the conductivity of blood as an indication of flow rate. In this program, the Bureau scientists studied various placements and sizes of electrodes, both previously used and new. Closely spaced electrodes-separated by 1/32 inch, for example-were found to conduct in inverse proportion to flow rate, a phenomenon not yet entirely understood. The conductivity between electrodes more widely spaced in the bloodstream, on the other hand, was found to increase with flow rate but to tend to saturate at higher rates in tests at the Bureau and elsewhere.

A significant finding from laboratory simulation of blood flow was that in measuring conductivity only one of the two electrodes must be in the flowing portion of the stream; the other electrode may be placed in a relatively quiescent portion of the stream. A second significant finding was that with the electrodes so positioned the conductivity was a cube root function of the flow rate. As yet, the reason for this precise cubic relationship is not known; other fluids do not behave in this way, not even those containing cells analogous to red corpuscles (the movement of which apparently is actually measured as conductivity).

Flow Rate Instrumentation

The instrumentation devised by the NBS team to determine flow rates uses electronic, optical, and mechanical components. It consists of an electrode-tipped catheter, an external electrode, signal circuitry, and cubing and recording circuitry. An a-c signal at 2400 Hz is imposed at a fraction of a volt across the blood path in series with one arm of an automatically balanced electrical bridge. Pulsatile

flow imposes amplitude modulation on the signal, which is amplified and the modulation detected. The modulation is compensated electrically for an apparent time lag of corpuscle movement and applied to position an opaque plate with a third-power exponential opening cut in it. Light passing through both the opening and a slit in another opaque plate across it is sensed by a photocell and applied to a strip recorder.—U.S. Department of Commerce, NBS, November 1965—STR-3256.

ROLE OF THE DOCTOR IN THE NEW MEDICARE PROGRAM

A subcommittee of seven physicians and two representatives of hospitals and Blue Cross met November 5 at Social Security Headquarters in Baltimore to continue discussions initiated last month on the role of the doctor in the new medicare program.

The group will consider draft policy recommendations covering the operation of hospital utilization committees.

Under the medicare program participating hospitals and other institutions will need to have utilization plans providing for the review of hospital stays by staff committees. Such committees must include at least two physicians.

The review will involve examination of admissions, length of stay and the medical necessity of the services provided on a sample or other basis. "A major emphasis in this review can be statistical and should be directed to the promotion of efficient use of available facilities," said Arthur E. Hess, Director of Social Security's Bureau of Health Insurance to the group.

"The review," he said, "will focus attention on the appropriate type and level of care for the individual patient at each stage of his illness. The attending physician will, of course, be consulted on any decision affecting his patient."

Hess noted that the principles of utilization review are endorsed by a great many in the medical profession, including the AMA. However, such procedures are in a stage of early development, he said. The medicare legislation recognizes the need for flexibility and a wide variety of review plan patterns can fulfill the purposes of the law.

The subcommittee is part of a full 41-member consultant work group concerned with physician participation. The parent group held its first meeting October 8-9, and is one of nine work groups that are being called upon to contribute experience and advice to help the Social Security Administration de-

velop policies for the administration of the new program of health insurance for the aged.

Results of the consultant group meetings will be presented to the Health Insurance Benefits Advisory Council, a permanent 16-member council to be appointed in accordance with the law by Secretary of Health, Education, and Welfare, John W. Gardner. The Advisory Council will advise the government on administrative policies and on the formulation of regulations for the medicare program.—USDHEW, Social Security Administration, November 5, 1965.

SULFONYLUREAS

Hypothyroidism

Although there is experimental evidence that the sulfonylurea drugs have anti-thyroid activity, hypothyroidism solely due to their long-term clinical use has not been previously described. In the present study, 220 diabetics treated with Orinase (tolbutamide) or Diabinese (chlorpropamide) were compared with a control series of 229 diabetics treated by other means. A highly significant difference in the incidence of hypothyroidism was observed in the two groups. The incidence of hypothyroidism was shown to increase with the duration of sulfonylurea therapy.—Hunton et al. (Sheffield), *Lancet* 2: 449, September 4, 1965.—Republished from CLIN-ALERT No. 279, October 29, 1965, by permission of Science Editors, Inc.

LIFEBLOOD BANK IN COLD STORAGE

Al Salie and Bill Dunccliffe, Record American, November 12, 1965, page 1

If you believe that Bombay is a city in India, you're right—and you're wrong. You're likewise if you think that Vel is a detergent, Duffy an Irishman, and Cellano an Italian.

Because not only is Bombay a city, Vel, a soap powder, etc. All are also the names of extremely rare types of blood—blood that is at this very moment being kept in cold storage at Chelsea Naval Hospital.

For the past 13 years, at Chelsea Naval, also at the Mass General Hospital, and at the VA Hospital in Birmingham, Ala., an ambitious research program aimed at preserving blood in useful form not for days or weeks, but for years, has been in progress.

And it has succeeded, to the point where blood kept in cold storage for as long as five years has been successfully transfused into patients in need of it.

Currently in freezers at Chelsea Naval are 800 pints of whole blood, frozen by a process developed by Dr. Charles Huggins of the Mass General. Most of it is Type O, the most common variety, but there are 10 units each of every rare blood type known to science.

For instance, there are only four people in the U.S. who have Bombay-type blood—but 10 pints of it are kept in cold storage at Chelsea, ready to be flown wherever needed.

Four months ago, a Detroit woman hemorrhaged badly after surgery and a hurry call was sent out for Vel-type blood. Four units of it, one of which had been drawn from a donor in Marseille, France, a year ago, were flown to Michigan, and helped to save her life.

Last August, a 19-year-old girl dying in a hospital in Los Angeles County, Cal., was saved when units of JSB-type blood were sent to her from Chelsea.

For years, the freezing of whole blood was a lengthy and time-consuming process, but Dr. Huggins developed a method in which a mixture of glycerol and dimethyl sulfoxide was added to blood

which; placed in a plastic bag, was frozen to 115 degrees below zero.

When the blood is needed, the plastic bag is placed in a "bath" of 40-degree water, until the bag becomes pliable.

Then the solution is washed out of it and, less than half an hour after being taken from the freezer, the whole blood is ready for use.

In charge of the program, which one day soon may mean the difference between life and death for American fighting men, is LCDR C. Robert Valeri of the Navy Medical Corps, who has been working hand-in-glove with Dr. Huggins and Dr. Grover Rasmussen of the MGH, with the Protein Foundation at Harvard, with the Red Cross and American Assn of Blood Banks and with everyone concerned with preservation of life.

Rare blood types are now furnished—free—from the Naval Hospital wherever they are needed and researchers visualize the day when bone marrow and vital organs can, like blood, be placed in a state of suspended animation toward the time when needed to push back the barrier of death.

DENTAL SECTION

Holiday Season's Greetings

The season has arrived again when we reflect with good thoughts, and enjoy the pleasant company of family, relatives, and friends. This Christian tradition makes us thankful for our blessings and helps us to relax and enjoy the few days of rest from our daily tasks and military obligations.

Our devotions should include genuine expressions for the many officers and men who are serving their holiday season by contributing their efforts to defend our way of life and the freedom of other free nations. I wish to join with all of you in wishing them well.

I would, also, like to express my thanks and gratitude for your cooperation and tireless efforts in accomplishing the mission to which we are dedicated.

To all members of the Dental Corps of the United States Navy and their loved ones, wherever they may be stationed, I extend my warmest and sincerest wishes for health and happiness during the Holiday Season and throughout the New Year.



F. M. KYES
Rear Admiral, DC, USN
Assistant Chief of the Bureau of
Medicine and Surgery (Dentistry)
and Chief, Dental Division

STUDY OF ACRYLATE-AMIDE FOAM IN EXPERIMENTAL OROFACIAL SURGERY

McFall, T. A., Henefer, E. P. and Clinton, E. E.
J Oral Surg 23(2): 108, 1965.

Acrylate-amide elastomer, developed at the Army Prosthetic Research Laboratory, Walter Reed Army Medical Center, was found by investigators at the University of Pennsylvania School of Dental Medicine to have value in procedures which require improvement of denture stability via rebuilt ridges and restoration of lost contours of oral and facial tissues. In the form of a foam, the material appears to be nontoxic, nonallergenic, and noncarcinogenic, and incites little foreign body response. It is readily shaped and sterilized, easily inserted, and allows fibrous ingrowth.

In the present experiment, subcutaneous and subperiosteal tissue implantation was performed on rats. Periodic histologic examination over the following 28 weeks revealed no rejection of, or foreign body cellular reaction to, the retained implants. Over a long period, osteoid formation with final differentiation into mature bone can occur.

HEALING OF PERIODONTAL POCKET TISSUES FOLLOWING ULTRASONIC SCALING AND HAND PLANING

Schaffer, E. M., Stende, G., and King, D.
J Periodont 35(2): 140, 1964.

Following a review of current literature, this study was designed to compare tissue response to ultrasonic scaling and hand planing. Alternate buccal pockets were either scaled with ultrasonic instruments shaped like McCall curettes or scaled and planed with hand curettes designed by McCall. Both types of instruments were held against the surface of the tooth at all times. Biopsy excisions were made of the pockets—immediately, and at two and seven-day intervals. The results demonstrated partial removal of the epithelial lining of the pockets following both ultrasonic and hand instrumentation. Epithelial migration was observed in the two and seven-day biopsies. The proliferation of the epithelium over the wound surface appeared to be incomplete in some of the seven-day specimens. The main problem in this preliminary survey was the lack of a control. To correct this, the following study was designed.

Interproximal periodontal pockets were selected at random, provided that their depths were the same, on distal and mesial proximating surfaces.

The paired proximating pocket depths varied from 3 to 7 mm. The mesial pockets were experimental and were either scaled by dull ultrasonic tips, or scaled and planed by curettes. To insure representative sections of the pockets, the entire mesial surface, along with the mesiobuccal and mesiolingual angles were scaled or planed. Ultrasonic or hand instruments were used on alternate pockets. The distal pockets served as the controls. Each control pocket was equivalent in depth to the experimental pocket to permit accurate comparison. Complete biopsy excisions of the experimental and control pockets included tissues apical to the bottom of the pockets. These specimens were removed immediately, 2, 4, 6, 12, 18, and 24 days postoperatively. Both ultrasonic scaling and hand planing removed some pocket epithelium, although the pocket wall was not intentionally curetted. The wounds were similar as to the degree of epithelial debridement and the surface texture, in both experimental and control cases. The control specimens showed varying degrees of intra-extracellular edema, hydropic degeneration and necrosis. In the experimental cases, healing was first observed in the two-day biopsies, with epithelial migration and proliferation. The migration over the corium proceeded from the coronal epithelium and from the apical epithelium when it was present. It was not complete in some of the eighteen-day healing wounds. Calculus was seen in many of the wounds. The character of the epithelium and inflammation in the corium of the experimental specimens was very similar to the controls after twenty-four days. (Abstract submitted by CAPT P. C. Alexander, DC USN.)

CHRONOLOGICAL HISTORY OF LOCAL ANESTHESIA IN DENTISTRY

Dobbs, Edward C., Dental School, University of Maryland, Baltimore, Md., *J Oral Therapeut & Pharm* 1:546-549, March 1965.

Interviews with officials of several American drug companies, plus historical data, provide the basis for this brief chronology.

In 1884, Karl Koller introduced cocaine as a topical anesthetic. In 1885, Hall introduced cocaine as a local anesthetic in dentistry. In that same year William S. Halsted demonstrated the mandibular nerve block injection. R. B. Waite founded the Antidolor Manufacturing Company and produced cocaine solutions for the dental profession in 1891. In 1901, E. Mayer suggested the addition of epinephrine to promote vasoconstriction.

In 1904, Alfred Einhorn, working in Munich, synthesized procaine (Novocaine). That same year, Stolz synthesized epinephrine. Procaine tablets, with and without epinephrine, were introduced to dentists in 1905. In 1920, H. S. Cook introduced the anesthetic cartridge and cartridge syringe. About 1929, buffered solutions of procaine and epinephrine were introduced by the Novocol Chemical Company; in 1935, this company introduced the vacuum packaging of dental cartridges.

Procaine was supreme until butethamine hydrochloride (Monocaine) was introduced to the dental profession by S. D. Goldberg and W. F. Whitmore in 1937. In 1935, the use of local anesthesia for cavity preparations became widespread.

Cook-Waite Laboratories added tetracaine (Pontocaine) to its procaine in 1940, increasing the anesthetic potency and duration of anesthesia. In 1940, phenylephrine (Neo-Synephrine) was introduced by Mizzy, Inc., as a vasoconstrictor.

In 1949, Astra Pharmaceutical Products, Inc., introduced lidocaine (Xylocaine), which had been synthesized in Sweden by Nils Lofgren in 1943.

Competitive products were marketed in rapid succession.

The dental cartridge, syringe, and needle were introduced in 1920 and marked the beginning of dental local anesthetic preparations as we know them today. (Den Abs 10(7): 426, July 1965. Copyright by the American Dental Association. Reprinted by permission.)

EIGHTEEN MONTHS WITH CERAMCO

By *CAPT William D. King DC USN, U.S.
Naval Station, Charleston, S. C.*

In February 1964, at the suggestion of the Inspector-General, Dental, plans were made to initiate a porcelain fused to gold (ceramco) crown and fixed partial denture technique for select cases. In the ensuing 18 months this procedure has worked out so well it is now being rendered as a routine service, with approximately 90% of all veneer type restorations being completed by this technique.

The clinical advantages of porcelain-gold restorations versus the plastic veneer type are well known and appear to justify the supplemental laboratory procedures and materials; particularly when the time and expense factors, on balance, compare favorably with gold-plastic techniques.

Materials. Many laboratories have a porcelain furnace of the former stock issue type, and the presence

of one at this activity precipitated the idea of putting it to use for the ceramic gold technique. A new muffle and calibration of the pyrometer rendered it accurate for the firing procedure.

The following items must be obtained "open purchase": (1) A ceramco porcelain powder kit of basic shades, including Britecote, opaques and glaze; (2) High melting point, Type III gold (ceramco gold); (3) High heat hygroscopic investment (Ceramivest).

A Thermotrol casting machine can be used to melt ceramic gold if care is taken in the upper temperature ranges (2150° F); however, there is always the danger of burning out the muffle. Therefore, a separate casting rig is advisable. In this instance an adapter was constructed for the Thermotrol base so that a manual casting arm could be interchanged.

A standard gas-air torch will not produce a flame of sufficient intensity to melt this type of gold properly; therefore, a gas-oxygen torch was obtained and this was connected by a special regulator to Medical Department gas-oxygen tanks of the same size.

Recent experiments have shown that a Ticonium casting unit will heat ceramic gold to fusion temperature in close to optimum time, and this is our present method of making the castings. A separate crucible for the gold is all that is required.

Technique. Preparations for ceramco restorations are more conservative than acrylic veneer types, in that deep shoulders at the critical labial-gingival areas are unnecessary; heavy chamfers provide better outline form for the castings.

Standard indirect technics utilizing elastic impression materials and removable stone dies are followed. Thimbel type wax-ups are fabricated for the castings with the bulk of the restoration, including proximals and incisals, being completed in porcelain. Quick cure resins of the Duralay type are satisfactory for this step and can be fabricated in a matter of minutes. It is unnecessary to incorporate beads, undercuts, or other forms of mechanical retention in the metalwork, as the physical and chemical type of bonds between the two materials is sufficient.

Hygroscopic, vacuum investing and unit casting of bridges is advocated, although solder assembly procedures may be done. This is better accomplished after the pontics and abutments have been fired, as soldering temperature is lower than the fusion temperature of the porcelain.

The castings are rough finished and Britecote is flashed on the labials to provide a warmer back-

ground, similar to flash gold plating. Fusing the porcelain to gold is basically a three-step procedure:

1. Opaque powders are mixed with distilled water and applied with a brush to uniformly cover the casting, and all excess water is removed with absorbent tissue after alternately vibrating or condensing, then blotting. The casting with porcelain application is seated on a suitable sagger tray and placed on the shelf by the oven door to preheat prior to insertion into the furnace, which has been preheated in the meantime to a 1200–1400° F. temperature range. After two to three minutes of drying the assembly is placed in the oven and the first bake of opaques is made at 1825–1850° F. An accurately calibrated pyrometer will generally assure a fusion temperature; however, a visual observation may be made to assure that firing has occurred. This first bake takes approximately eight (8) minutes with the optimum elevation of oven temperature being 75° per minute. The restoration is removed immediately after firing, bench cooled, and the oven temperature lowered to preheat range.

2. Upon ascertaining that first bake fusion and bonding is complete, body and incisal shades of powder are built up by the same painting, condensing, and blotting technique until the general anatomic outline, including proximals and incisors, are rough shaped and slightly overcontoured. The same preheating, firing, and recovery technique is followed. When this bake is completed the outline should be generally overcontoured (if deficiencies are present a third bake may be necessary) then the restoration is rough finished.

3. Glaze bake is deferred until the appointment for insertion, at which time the dental officer does the final reshaping and modifications of the restoration at chairside, then returns it to the laboratory for final glaze. The additional appointment time for this step is minimized by having the oven preheated and during the time the technician is glazing, oral proce-

dures preliminary to cementing can be accomplished.

Other Pertinent Factors. Laboratory space for this technique should be in an area comparatively free from dust and laboratory contaminants, as small foreign particles in the porcelain powder cause noticeable blemishes. A pyrex glass should cover the restoration at all times when outside of the oven during preheating and cooling.

Technicians with better than average skills can render this technique, and a one week course at a commercial establishment will suffice for their training and fundamentals.

No comparative time studies have been run, but the overall laboratory time for fabricating this type restoration may be no longer than the time required for the various steps of acrylic veneering (wax-up, investing, boil-out, packing, curing, breakout and polish).

The cost of ceramic gold is double that of stock 0250; however, only one-third to one-fourth the amount of metal is required in ceramco restorations, thus adding up to an overall savings in gold.

A porcelain powder kit is the most expensive item; however, a complete kit with all basic shades costing \$100–\$150 should be sufficient for a year's supply with three to six month replacement of jars of the most commonly used shades.

The breakage factor is insignificant to date. In approximately 200 ceramco units delivered, two known fractures have occurred: one requiring replacement and one on a bridge was repairable.

An immeasurable factor is the enthusiasm for this program. The technician takes great pride in artfully producing a restoration of superior quality. The dental officer is professionally satisfied that he is clinically providing the best in the way of crown and bridge replacement, and the patient, when properly briefed, feels highly gratified to be the recipient of this extra service.

PERSONNEL AND PROFESSIONAL NOTES

KNOW YOUR DENTAL CORPS. Situated on the Miura Peninsula of Honshu Island, is the U.S. Naval Dental Clinic, a component command of U.S. Fleet Activities, Yokosuka, Japan. Commanding a view of the entrance to Tokyo Bay and nearby Mt. Fuji, this modern dental facility occupies a portion of a former Imperial Japanese Naval Hospital. Beginning twenty years ago, as part of a naval dispensary, the

Secretary of the Navy authorized its establishment as the tenth of eleven dental commands, on 11 January 1957.

The U.S. Naval Dental Clinic, Yokosuka, Japan, is under the command and support of the Bureau of Medicine and Surgery, and under the area coordination control of Commander, Naval Forces, Japan. Its mission: "To provide a complete dental service



to Navy and Marine Corps shore activities, units of the operating forces, and other authorized personnel in the geographical area." Specifically, this command furnishes complete dental care to military personnel and their dependents in the area, and specialized service to shore activities and the operating forces that are without complete dental facilities. This includes the services of a staff dental repairman. The main facilities consist of twenty operatories, including oral surgery, periodontic, endodontic, and prosthodontic offices, in addition to necessary auxiliary spaces. As one of the activities recently selected for a special preventive dentistry program, additional facilities are being converted to provide space for indoctrination, twelve basins for self-preparation, and three operatories for topical stannous fluoride application. An annex is located in Yokohama, approximately 15 miles North, which serves the Yokohama Housing Activity with complete dental care, including surgery and prosthetics. Although the clinic facilities serve approximately twice as many dependents as military personnel, 60 percent of the dental treatment is provided for the military.

The staff presently consists of twenty-two dental officers, one administrative officer, twenty-one dental technicians, and twenty-eight Japanese employees. Ten of the enlisted personnel are prosthetic laboratory technicians. Most of the Japanese employees are female dental assistants, with local Navy train-

ing. They are extremely capable, with many having continuous service in excess of ten years, and two with nineteen years of devoted duty. The Kanagawa Dental College and School of Dental Hygiene are located literally next door to the U.S. Naval Dental Clinic. An excellent rapport is enjoyed among these professional organizations. The staff dentists of the college and many of the students avail themselves of observerships offered by the Navy clinic.

Dental officers of the command participate as members of the American Stomatological Society of Japan. The leadership of this group rotates each year among the three U.S. armed services. Its popularity has grown to such an extent that the annual three-day convention is attended by military dentists from all the East-Asian areas, in addition to the Japanese associate members.

The city of Yokosuka is the most important, and largest in the area in the Shonan District. It is situated in the central part of the Miura Peninsula, which is noted for many landmarks and places of interest. The Japanese Maritime Self-Defense Force Academy is situated in view of the Fleet Activities, and the harbor of Kurihama. This is where Commodore Matthew C. Perry landed in 1853 and opened Japan to the western world. It is but six miles distant. The Black Ship Festival, held each year on the 14th of July, commemorates this event. The Emperor's Summer Palace is also on the Miura Peninsula. In view of the dental clinic is a Japanese National

Monument, Admiral Togo's flagship, Mikasa. From her bridge, he directed the victory at Tsushima during the Russo-Japanese War, in 1905. The Mikasa was restored in 1962, through the efforts of the U.S. Navy and the Japanese people. A half-hour drive across Miura Peninsula is Sagami Bay and Enoshima Island, site of the yachting events in the 1964 Olympiad. Kamakura is within an hour's drive, northwest, and is noted for its many shrines, particularly the great image of Buddha, which was cast in the 13th century.

The climate of the Tokyo Bay area, including Yokosuka, can be considered mild in that it is somewhat similar to the middle belt of the United States and the South of Europe. Mean annual rainfall is higher, but snowfalls are light in the winter. Occasional earth tremors are a part of the way of life, as is the typhoon season in September. The beauty of the land, as well as the culture of the people, helps make the U.S. Naval Dental Clinic, Yokosuka, Japan, a treasured duty station.

DENTAL OFFICER PRESENTATIONS. CAPT Robert Middleton DC USN, currently stationed at the U.S. Naval Hospital, Oakland, and CAPT Guy E. Courage DC USN, U.S. Naval Hospital, Camp Pendleton, served as U.S. Navy Delegate and Alter-

nate to the 47th General Meeting of the American Society of Oral Surgeons, 2-5 November, 1965, in Denver, Colorado. CAPT Middleton presented a Registered Clinic titled "Vertical Ramus Osteotomy in Treatment of Malocclusion."

RESERVE COMPANY RECEIVES ANNUAL INSPECTION. RADM M. E. Simpson DC USN, Director, Dental Activities, 11th Naval District, conducted an administrative inspection of U.S. Naval Reserve Dental Company 11-1 on 20 October 1965. The commanding officer, CDR R. E. McKig DC USNR was commended by Admiral Simpson for the excellent rating received by his company.

CDR C. A. DeLaurentis DC USN, Administrative Command, USNTC, San Diego, California, gave an interesting and informative talk, concerning dentistry afloat, following the inspection.

COMBINED SERVICES QUARTERLY DENTAL CONFERENCE. CAPT R. C. Shaw DC USN, Commanding Officer, U.S. Naval Dental Clinic, Pearl Harbor, Hawaii, hosted the October conference of over 100 Armed Forces dental officers in the Honolulu area. CAPT T. J. H. Rinck DC USN served as program chairman for the following presentations:

CLINICIANS

CAPT J. W. Miller & LT J. V. Herrick DC USN
U.S. Naval Dental Clinic, Pearl Harbor
LCDR D. L. Hall & LT D. R. Riley DC USN
U.S. Naval Dental Clinic, Pearl Harbor
LCDR R. S. Hulse & LT R. L. Hendriksen DC USN
U.S. Naval Dental Clinic, Pearl Harbor
LCDR R. E. Timby DC USN
U.S. Naval Dental Clinic, Pearl Harbor
LT T. J. Frankmore DC USNR
U.S. Naval Dental Clinic, Pearl Harbor
LT D. G. Hillenbrand DC USN
U.S. Naval Dental Clinic, Pearl Harbor
LT B. M. Sharp DC USN
HQ FMF Pac
DTCS B. Hawkins & DT2 R. Jackson
U.S. Naval Dental Clinic, Pearl Harbor

MONITORS

LCDR P. Hatrell DC USN
HQ FMF Pac
LCDR H. J. Keene DC USN
1st MARBRIG FMF Pac

TABLE CLINICS

Centric Occlusion Full Dentures

The Post with a Future

The Use of Retention Pins in Modern Dentistry

Medical Emergencies in the Dental Office

A Technique for Class V Restorations Utilizing Powdered Gold Foil (Golden)
Temporary Splinting of Anterior Teeth with Stainless Steel Wire
X-ray Angulation in Endodontics

The Prosthetic Laboratory in Operation

DISPLAYS

Field Dental Unit

Prosthetic Field Dental Unit

AVIATION MEDICINE SECTION

CNO AEROMEDICAL TEAM VISIT TO VIETNAM AND SEVENTH FLEET

By CAPT Frank H. Austin, MC, USN.

With the step up in Naval Air Operations engendered by the Vietnam conflict, questions concerning pilot and crew fatigue/morale factors which might develop, were posed to the office of the Assistant Chief for Aviation Medicine from several levels of command.

To expedite the gathering of aeromedical information for studies of personnel requirements, deployment and rotation scheduling and safety equipment needs, the Chief of Naval Operations ordered three Flight Surgeons to Southeast Asia on TAD for the month of September 1965. This team, CAPT R. E. Luehrs (Naval Aviation Safety Center), CAPT F. H. Austin, (Bureau of Medicine and Surgery/Office of the Chief of Naval Operations) and CDR R. G. Ireland (Aerospace Crew Equipment Laboratory), visited ships and air wings of Task Force 77 operating in the South China Sea and Tonkin Gulf against Vietnam targets, and visited Marine Aviation Units in Vietnam. More than thirty-six squadrons were contacted. The itinerary of the team included the following commands:

- a. USS INDEPENDENCE/Carrier AIR WING SEVEN
- b. USS CORAL SEA/Carrier AIR WING FIFTEEN
- c. USS ORISKANY/Carrier AIR WING SIXTEEN
- d. USS MIDWAY/Carrier AIR WING TWO
- e. 1st Marine Air Wing (Da Nang, Chu Lai, MAGS 11, 12, 16, 36)
- f. COMSEVENTHFLT
- g. FMFPAC (Medical)
- h. COMNAVAIRPAC (Medical)

The fifth ship on combat station, the USS BON HOMME RICHARD was not visited on this trip.

The modus operandi of the team was to observe and to discuss at the working level with flight surgeons, pilots, commanding officers and others, the

problems being encountered due to the increased pace of operations and extended deployments.

Upon return to CONUS, the team personally debriefed DCNO(Air), BUMED, BUWEPS(RA), CNO and SECNAV and submitted a report which has been distributed to major commands by CNO letter OP-05A, ser 068P05 of 2 November 1965 (Confidential).

Recommendations were made with the aim of alleviating some of the factors which might lead to excessive physical and psychic fatigue, depreciated morale and a diminution of mission motivation and career motivation of flying personnel in an extended conventional weapons conflict.

WOMAN OFFICER ATTAINS NEW DISTINCTION

For the first time a woman has been selected for the grade of Captain in the Medical Service Corps of the United States Navy. While women officers have attained this grade as regular WAVE officers and as members of the Nurse Corps, this opens another area wherein the fair sex can serve with distinction.

The selection of Commander Mary F. Keener, Medical Service Corps, United States Navy, was announced recently by the Secretary of the Navy.

Commander Keener entered the Navy in October 1942 after receiving a B.A. degree from the University of Alabama where her major work was in zoology. She attended the first Midshipmen School for WAVES at Smith College, Northampton, Massachusetts. She was commissioned Ensign in January 1943 and was assigned to duty as communications officer in the Office of the Chief of Naval Operations, Department of the Navy, Washington, D.C. In June 1944, her classification was changed to Hospital Corps because of her educational background in science. She was then ordered to the Naval School of Aviation Medicine (now the Naval Aerospace Medical Institute), Pensacola, Florida for training as an aviation physiologist. Upon completion of training, she was assigned to duty at the School as an instructor. Other duty stations include: Naval Medical Re-

search Institute, Bethesda, Maryland and various Naval Air Stations including Grosse Ile, Michigan; Memphis, Tennessee; Norfolk, Virginia; and Barbers Point, Hawaii.

Most of Commander Keener's career has been spent in teaching naval aviators and aircrewmembers how to meet emergencies they may encounter miles above the earth. She is widely known among Navy, Marine Corps, and Air Force aviation personnel as she has probably trained more aviation personnel in oxygen equipment, night vision, ejection seat procedures, and low pressure chambers than any other aviation physiologist in the Armed Forces.

Commander Keener was elected Honorary Member of the Year of the Wives' Wing of the Aerospace Medical Association in 1959 for outstanding achievement in aviation medicine.

In her present assignment Commander Keener is Head of the Aviation Physiology Training Branch and Head of the Aviation Physiology Systems Requirements Section in the Bureau of Medicine and Surgery, Department of the Navy, Washington, D.C. In these capacities she plans, directs and coordinates the aviation physiology training program for naval aviation personnel.—Aviation Medicine Section, BuMed.

AIRCREW PHYSIOLOGICAL PROTECTIVE EQUIPMENT MEETING

A meeting on Aircrew Physiological Protective Equipment was held at the U.S. Naval Aerospace Medical Institute, U.S. Naval Aviation Medical Center, Pensacola, Florida on 27 and 28 October 1965.

The purpose of the meeting was to disseminate information on research, development, test and evaluation of certain items of protective equipment to personnel responsible for conducting fleet training programs.

The total number of attendees was one hundred and one (101), representing sixteen (16) naval activities. Among those attending were twenty-nine (29) aviation physiologists, two (2) flight surgeons, one (1) line officer (aviator), sixty-four (64) enlisted technicians and five (5) civilians.

Agenda items included: the Integrated Oxygen Helmet, the International Latex Partial Pressure Suit, the Experimental MK-5 Full Pressure Suit, Survival Equipment, Heat Removal by Liquid Cooled Undergarments and an Evaluation of the Relationship of SCUBA Diving to the Development

of Aviators' Decompression Sickness.—Aviation Medicine Section, BuMed.

FLIGHT SURGEON NAVAL AVIATOR GRADUATES FROM NAVAL TEST PILOT SCHOOL

LT Robert J. Kelly MC USN completed the Naval Test Pilot School at the U.S. Naval Air Test Center, Patuxent River, Maryland, graduating on the twenty-second of October as a member of Class Forty-One. He will assume duty as Head of the Aero-medical Branch, Service Test at the Center and in this capacity will coordinate numerous test and evaluation projects involving pilots personal safety and survival equipment, and himself fly as a test and project pilot in the Navy's latest operational aircraft.

LT Kelly is one of fourteen Flight Surgeons who are currently also active Naval Aviators, and the second to graduate from the Test Pilot School. He was designated a Naval Aviator in 1954 after a short tour as a shipboard officer and following his graduation as a regular NROTC officer from the University of Missouri with a degree in chemistry. He had a WESTPAC VS deployment, then was released to inactive duty. He attended George Washington Medical College, graduating with an M.D. in 1961 and took his internship at U.S. Naval Hospital, Bethesda. He attended the Naval School of Aviation Medicine (now Naval Aerospace Medical Institute), Pensacola, Florida, and upon being designated a Flight Surgeon in February 1963 was assigned to VF refresher training with subsequent assignment to duty as a Naval Aviator/Flight Surgeon.

Doctor Kelly was then assigned to Air Development Squadron-Four at Point Mugu and became carrier qualified in the F8 Crusader, as well as flying the F4 Phantom II as Project Officer for High Altitude Test projects. He had accumulated a total of over 2500 hours at this point in his flying career, over 500 of these being in high performance jet aircraft. He was then selected for the Naval Test Pilot School where he continued to accumulate experience in high performance Naval aircraft and learned the exacting techniques of test flying.

Among other duties and activities LT Kelly participated as Project Gemini Medical Monitor for the GT-3 space shot and has had extensive experience as a SCUBA diver.

It is the intention of the Bureau of Medicine and Surgery to maintain in-house capability in the aeromedical aspects of operational and test flying, by retaining a pool of motivated, current Naval Aviator

Flight Surgeons. Test flying and space flight are some of the many interesting fields to which these Flight Surgeons may be assigned.—Aviation Medicine Section, BuMed.

FIRST RECIPIENT OF THE HENRY A. IMUS AWARD

The Military Division of the American Psychological Association recently established, in memory of the outstanding service of Doctor Henry A. Imus (Captain, MSC USNR) in military psychology, an annual "Henry A. Imus Award" for the best psychological research reported by junior scientists in the military establishments. This Award is for individuals below the rank of Major/Lieutenant Commander in uniform and civil servants in the grade of GS-13 or lower.

LT Robert J. Wherry, Jr., MSC USN, an Aviation Experimental Psychologist at the Naval Aerospace Medical Institute, was the recipient of the first year's Award for research reported in a paper entitled, "A Study of Some Determiners of Psychological Stress". The study is concerned with identifying the individual and situational factors in anticipatory fear reactions. It measures individual differences in the disruptive effects of fear on performance.

A native of Lebanon, Tennessee, Lieutenant Wherry attended Ohio State University as an NROTC student. He received his B.S. degree and his commission in the U.S. Navy in 1955. After serving for two years as a deck officer in the USS STRONG, a destroyer, he transferred to the Medical Service Corps and was assigned to duty at the Naval School of Aviation Medicine (now the Naval Aerospace Medical Institute), Pensacola, Florida. During the next two years, on his own time and at no expense to the Navy, he completed the requirements for a Master's degree in Experimental Psychology which was conferred in March 1960. In September 1961, he was ordered by the Navy to Ohio State University for one year during which time he completed the requirements for a Ph.D. degree which was conferred the following year. Since returning to Pensacola in September 1962, LT Wherry has contributed to all phases of the Aviation Psychology Laboratory's activities including instruction in experimental design, original research, and development of advanced computer programs.

In December 1964, LT Wherry was a member of a three-man team awarded the Presidential Citation for recognition of significant economy or efficiency

achievements. The team utilized the probability prediction method to achieve early identification of flight students who would not be able to complete the flight training course. This has resulted in savings of more than \$700,000 per year to the Naval Air Training Command.—Aviation Medicine Section, BuMed.

NAVAL AVIATION SPEECH DISCRIMINATION TEST (NASDT)

The NASDT was designed to test the Naval Aviators ability to understand speech in the presence of high intensity noise such as that in the cockpit of an aircraft. It has been determined that there is some inconsistency between this ability and the threshold for pure tones as measured by standardized audiometric techniques.

Because of the foregoing fact and the desire to avoid unnecessary grounding of naval aviators whose hearing does not meet the pure tone standards, the Bureau of Medicine and Surgery may recommend approval of waivers for those aviators who pass the NASDT even though they fail the audiometer test. Each aviator who fails the audiometer test should receive the NASDT.

In order to make the test available to some activities conducting flight physicals, the instruments used to administer it have been placed at the following installations:

Commander
U.S. Naval Missile Center
(BioAcoustics Division)
Point Mugu, Calif.

Commanding officer
U.S. Naval Aerospace Medical Institute
(Audiology Branch)
Naval Aviation Medical Center
Pensacola, Fla.

Commanding Officer
(The Medical officer)
U.S. Marine Corps Air Station
El Toro, Santa Ana, Calif.

Commanding officer
(The Medical Officer)
U.S. Marine Corps Air Station
Cherry Point, N.C.

Commanding Officer
(The Medical Officer)
U.S. Naval Air Station, North Island
San Diego, Calif.

Commanding Officer
(The Medical Officer)
U.S. Naval Air Station
Norfolk, Va.

Commanding Officer
U.S. Naval Air Station
FPO, San Francisco 96611

Commanding Officer
U.S. Naval Air Facility
Washington, D.C.

All aviators who fail to meet the appropriate Service Group audiometric standards should be referred to the nearest installation having the instrument to conduct the NASDT in order that the results of this test may be included in the Report of Physical Examination.—Aviation Medicine Section, BuMed.

JUMPING PHYSIOLOGIST

Proud to be the first aviation physiologist to become qualified as a test parachutist, is Paul A. Furr, Lieutenant Junior Grade, Medical Service Corps, U.S. Navy. Completing the required 15 jumps using a variety of parachutes, he became qualified on 16 September 1965.

When not jumping LTJG Furr is the advisor on applied aviation physiology for the Naval Aerospace Recovery Facility, El Centro, California.

An appropriate ceremony was held at nearby Sun

Beam Lake for LTJG Furr, where he was honored by the enlisted test jumpers who tossed him into the lake. Later LTJG Furr received the personal congratulations of the Commanding Officer, CDR William H. Koenig.

Originally from Provo, Utah, LTJG Furr is a graduate of the University of Utah, and a member of the Phi Sigma Biological Society. He is married to the former Merlene Wright, who is also from Provo, and they have three children.—Aviation Medicine Section, BuMed.



EDITORIAL DESK

SPACE AND ASTRONAUTICS ORIENTATION COURSE

This course has been established to give senior officers of the Navy a better understanding of this new technology, its application to naval warfare, and its important role in national defense. The course is in consonance with the Navy's global mission and emphasizes the significant impact of astronautics on seapower. It is primarily designed for those senior officers who have not had the opportunity to gain knowledge of astronautics and current Space programs. A highlight of the course is a visit to the space vehicle launch and control facilities at Point Arguello Naval Missile Facility and Vandenberg Air Force Base.

Location: U.S. Naval Missile Center, Point Mugu, California

Duration of Course: Four days (Tuesday - Friday)

Convening Dates of Course:

11 January	1966
15 February	1966
15 March	1966
19 April	1966
10 May	1966
7 June	1966
12 July	1966
13 September	1966
25 October	1966
15 November	1966
6 December	1966

BUMED Quota: One for each class

Deadline Date to Apply: Immediately for the 11 January and 15 February courses, and six weeks in advance for the remaining courses.

Eligibility: Rank of Commander and above. TOP SECRET Security Clearance required.

In view of the shortage of travel funds for Fiscal Year 1966, only a limited number of officers can be authorized to attend these courses on travel and per diem orders chargeable against Bureau of Medicine and Surgery funds. Eligible and interested officers who cannot be provided with travel orders to attend at Navy expense, may be issued Authorization

Orders by their Commanding Officers following confirmation by this Bureau that space is available in each case. Requests should be forwarded in accordance with BUMED INSTRUCTION 1520.8 Series and comply with the deadline dates indicated above. All requests must indicate that a security clearance of TOP SECRET has been granted to the officer requesting attendance, and if Bachelor Officer's Quarters are desired.—Training Branch, BuMed.

NAVY NURSE AWARDED FEDERAL NURSING SERVICE AWARD

LCDR Norma Rita Coyle NC USNR received the Federal Nursing Service Award in November 1965 during the 72nd annual meeting of the Association of Military Surgeons of the United States. The award consisted of a scroll and an honorarium. It is presented annually to a professional nurse employed by the Federal government who has made an outstanding contribution to nursing. LCDR Coyle is a native of Champlain, New York. She graduated from the Memorial Hospital School of Nursing, Albany, New York; received a Bachelor of Science degree and a Masters degree in nursing from St. Johns University, New York; a Master of Science degree in educational psychology from Fordham University, New York. Doctor Coyle is currently serving at the Naval Hospital, Yokosuka, Japan. Prior to this assignment, she served as Head, Nursing Research Division, Naval Medical School, National Naval Medical Center, Bethesda, Maryland. Doctor Coyle received the Federal Nursing Service Award for submission of an essay entitled "*Creativity: Key Concept to Quality Nursing Care.*"—Nursing Division, BuMed.

U.S. NAVAL MEDICAL SCHOOL VISITED BY THAI MEDICAL EDUCATOR

Doctor Vikul Viranuvatti, one of the outstanding young Thais in medical education and pathology, visited the Naval Medical School, Bethesda, Maryland, on October 15, 1965.

The doctor is Dean, Faculty of Medical Technology, University of Medical Sciences, Siriraj Hospital, Thonburi, Thailand.

A visit to the Medical School was part of his tour of medical facilities in the United States arranged by the Office of International Health, Public Health Service, Washington, D.C.

Doctor Vikul's particular interests are the advances in clinical chemistry and related fields in medical technology made by American Medical Schools. He also observed training centers for X-ray technologists.

Formerly an instructor in Clinical Pathology at Siriraj Hospital, Thailand, Doctor Vikul was a Research Fellow in Hematology at the University of Washington from 1951 to 1953. He was one of the medical leaders in the establishment of the Chiangmai Medical School in Thailand.



Commanding Officer, U.S. Naval Medical School Greets Thai Medical Educator and Pathologist.—Technical Information Office, BuMed.

NAVY HOSPITAL CORPSMAN RECEIVES MEDAL

In ceremonies held on October 22, 1965 at the U.S. Naval Hospital, Chelsea, Massachusetts, the Purple Heart Medal was presented to Hospitalman Donald J. McConnell, who is currently undergoing treatment there.

CAPT Lewis L. Haynes, Medical Corps, U.S. Navy, the Commanding Officer of the hospital, made the presentation.



The Commanding Officer, U.S. Naval Hospital, Chelsea, Massachusetts, presents Purple Heart Medal to Hospitalman Donald J. McConnell.

McConnell received the medal for wounds received in hostile action on July 14, 1965, while serving with the U.S. Marine Corps in DaNang, Vietnam.—Technical Information Office, BuMed.

PHYSICIANS IN THE NEW MEDICARE PROGRAM

An advisory group of 35 consultants representative of the medical and health insurance professions met at social security headquarters in Baltimore October 8 and 9, to discuss the participation of physicians in the new medicare program.

Discussions at this first two-day meeting of the group covered the provisions of the law which call for a physician to certify to the medical necessity of services that will be covered by the new health insurance program.

Also up for discussion is the requirement that hospitals and other institutions providing services under the program have utilization review plans providing for review of admissions and length of stays.

The advisory group is one of nine work groups that will be called upon to contribute experience and advice to help the Social Security Administration de-

velop policies for the administration of the new program of health insurance for the aged.

"It has been and will continue to be our policy," Robert M. Ball, Commissioner of Social Security, told the advisory group, "to adopt rules and regulations and procedures only after consulting closely with people who have a professional interest and a technical competence in the program."

Ball noted that in an address last week to the House of Delegates of the American Medical Association, Secretary of Health, Education, and Welfare John W. Gardner, had described the purpose of the medicare legislation as bringing to more people than ever before "the best that medicine can offer without violating in any way the traditional relationship between doctor and patient."

Twenty-five of those in the advisory group are medical doctors, two are doctors of osteopathy, and one is a doctor of dental surgery. Among the organizations represented are the American Medical Association, the American Association of Medical Clinics, the American Hospital Association, the American Osteopathic Association, the American Osteopathic Hospital Association, the American Dental Association, the Blue Cross Association, the National Association of Blue Shield Plans. Also, generally representative of the health insurance field are representatives of the Continental Casualty Company, the John Hancock Insurance Company, the Metropolitan Life Insurance Company, the Group Health Association of America, and the Health Insurance Plan of New York.

Dr. Roberta Fenlon of San Francisco, recently appointed principal medical consultant to the Social Security Administration, is chairman of the advisory group.—USDHEW, Social Security Administration.

SOME MARINES AND A SAILOR PROVE WORTH OF JOINT ACTION

By Betsy Halstead

PHU BAI, Vietnam (UPI)—The four marines clear their rifles for trouble.

Walking with them through the clearing to a village is a 19-year-old sailor, a heavy medical kit slung over his shoulder.

"Doc" Harold S. Simmons of Ellenboro, N.C., is the corpsman attached to the 2d Squad Joint Action Co. in the village of Thuy Tan, less than 50 miles from the 17th Parallel that divides north and South Vietnam.

A few miles away, Marine LT Paul R. Ek whispers orders in Vietnamese and English for his 180 Republic of Vietnam troops and four squads of American marines, who are approaching a village where Viet Cong guerrillas are known to be hiding.

The young lieutenant is responsible for 35 miles of an area that borders a river 45 miles south of the 17th Parallel.

The area on the other side of the river is Viet Cong territory.

Both "Doc" Simmons and Ek and his troopers are part of the Marines' newly initiated joint action program.

Everyday from noon till 2 p.m., Simmons holds sick call for the 2,200 people of Thuy Tan, one of the villages in Ek's area of responsibility.

Sick call is in a small cement building in the heart of the village.

When there are villagers too ill to travel to the hut, "Doc" and his four marines go to them.

As they move from the center of the village to small thatched huts on the outskirts, the marines ready their rifles. The narrow jungle paths, with their thick forest cover, invite ambush from the Viet Cong.

The Viet Cong know of "Doc" and the Marine squad. And they watch them from afar. To date they have left them alone, but patients have passed on warnings to the "Doc" that the Viet Cong say they will come one day.

Simmons and his band of marines are the local Pied Pipers. As they walk through the village, the women and children swarm around "Bocsi," as Simmons is called, to cure their cuts, burns and bruises.

"These folks remind me of the folks back home," he says. "They're so friendly. They always invite me into their homes. I'd like to come back here some day."

Through the thick jungle and several miles away the lieutenant and some of his troops continue with their clearing operation.

Ek's 70-man company averages 25 night patrols and ambushes a week. They live and work with the Vietnamese villagers and once every three or four days, one squad will return to the battalion area for a night's rest.

The lieutenant leads his troops on through the village. It is night. Dogs howl. But the trap is set. The patrol has the man they were after, a known Viet Cong.

They also round up two Viet Cong who entered the village for a night's sleep.

"The Viet Cong originally thought we'd make fools of ourselves," Ek said. "We surprised them. We know the names of at least 30 or 40 Viet Cong in the area, and we let them know that we're after them. It keeps them loose.

"We're wise to their tricks. They snipe at us from houses, hoping we'll return their fire and hurt an innocent villager. We don't fall for it."

And so the night patrols continue through the 35-mile area as the "Doc" continues his sick calls, only 45 miles from the 17th Parallel and north Vietnam.

NEW MEASLES, VIRUS VACCINE AVAILABLE

FMSO-FLDBRBUMED INSTRUCTION 6700.1A CH-49 of Nov. 9, 1965 advised the following:

<i>FSN</i>	<i>NOMENCLATURE</i>	
6505-913-8557	Measles, Virus Vaccine, Live, Attenuated, Lyophilized, 0.5cc, single dose, 10's	
<i>AVAILABILITY</i>	<i>U/I</i>	<i>UNIT PRICE</i>
7 October 1965	BX	18.60

This is a further attenuated Schwarz Strain Measles Virus Vaccine not requiring the co-administration of gamma globulin. (Lirugen is the commercial equivalent)

The availability of this item in the Defense Supply System should preclude further open purchase procurement.—Code 4A, BuMed.

POSTGRADUATE SEMINAR — SURGICAL AND ORTHOPEDIC ASPECTS OF TRAUMA

7-11 February 1966
Brooke General Hospital,
Brooke Army Medical Center,
Fort Sam Houston, Texas

The program is designed to present, by means of papers, panel discussion, case presentations, and question and answer periods, current trends and newer concepts in the management of trauma, as well as elaboration upon previously accepted principles.

Program participants will include not only authorities in the various fields of trauma from the military service, but also distinguished guests from civilian institutions.

Among the subjects to be discussed are included: Shock and Resuscitation, Wound Infections and Antibiotics, Management of Burn Injury, Abdominal Trauma, Thoracic and Cardiovascular Injuries, Combined Thoracic-Abdominal Injuries, Injuries to the Brain, Spinal Cord, and Peripheral Nerves, Urological Injuries, Multiple Injuries and Orthopedic Injuries.

Only a limited number of officers can be authorized to attend the seminar on travel and per diem orders chargeable against Bureau of Medicine and Surgery funds. Eligible and interested officers who cannot be provided with travel orders to attend at Navy expense may be issued Authorization orders by their Commanding Officers following confirmation by this Bureau that space is available. Requests should be forwarded immediately via chain of command, in accordance with BUMED INSTRUCTION 1520.8 Series.—Training Branch, BuMed.

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—Editor

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